

Building for reliability

Facilitator
Chief Technology Officer, Monzo

Make money work for everyone



**Founded
in 2015**

More than

15m

customers

(+3m in 2025!)



**>900,000
business
customers**

The anatomy of trust



Competence

Do they provide the best possible products and services?



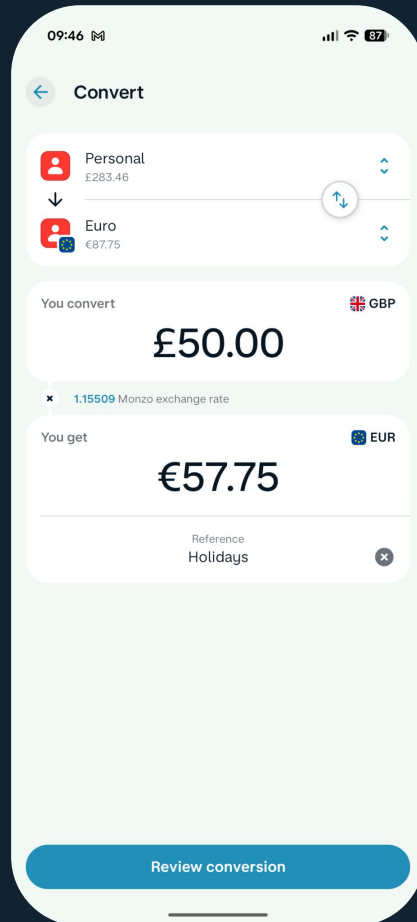
Integrity

Do they have my interests at heart?



Reliability

Do they show up consistently when I need something?



09:46

← Convert

Personal
£283.46

↓

Euro
€67.75

You convert GBP

£50.00

× 1.15509 Monzo exchange rate

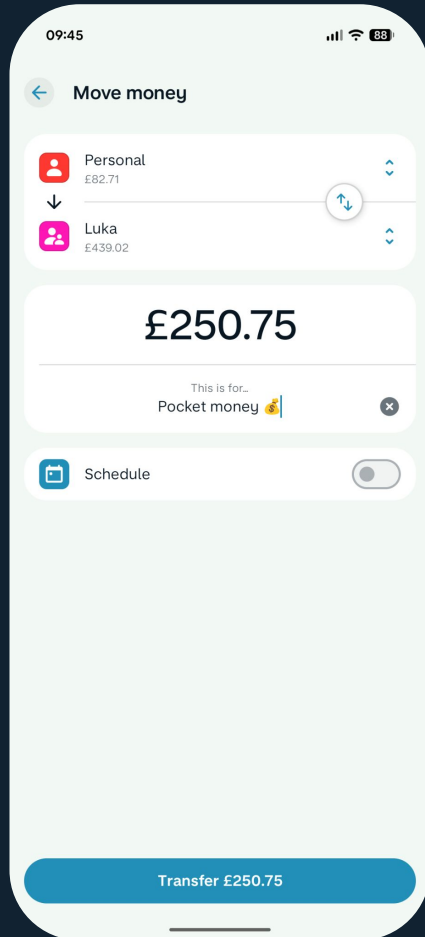
You get EUR

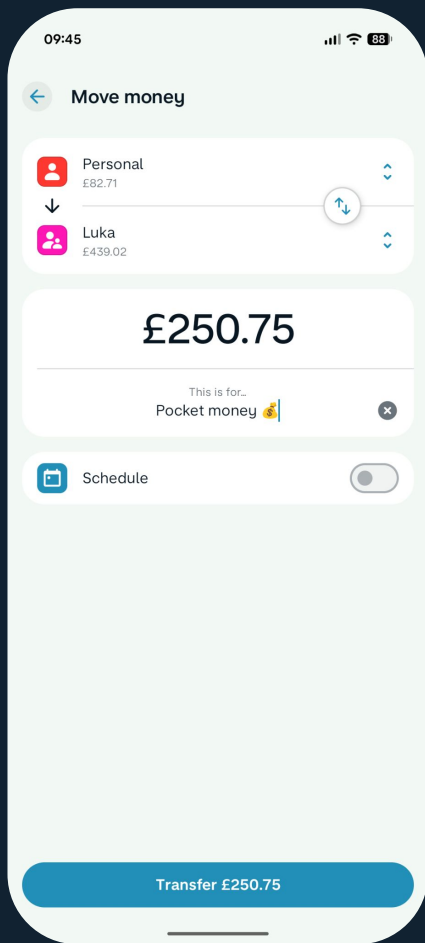
€57.75

Reference
Holidays

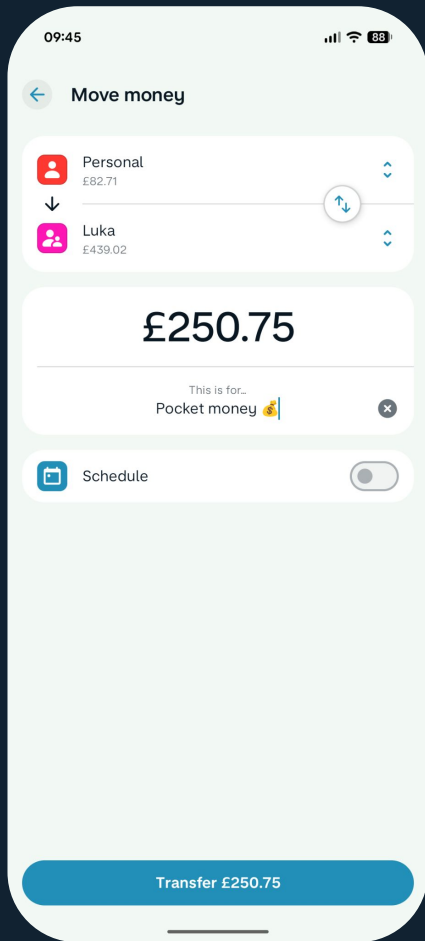
Review conversion







1% drop in move
money flows ...



... because of a
100ms latency
increase

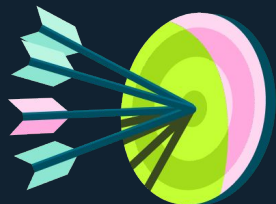
The Monzo platform



>3000 micro services



~300 deployments per day

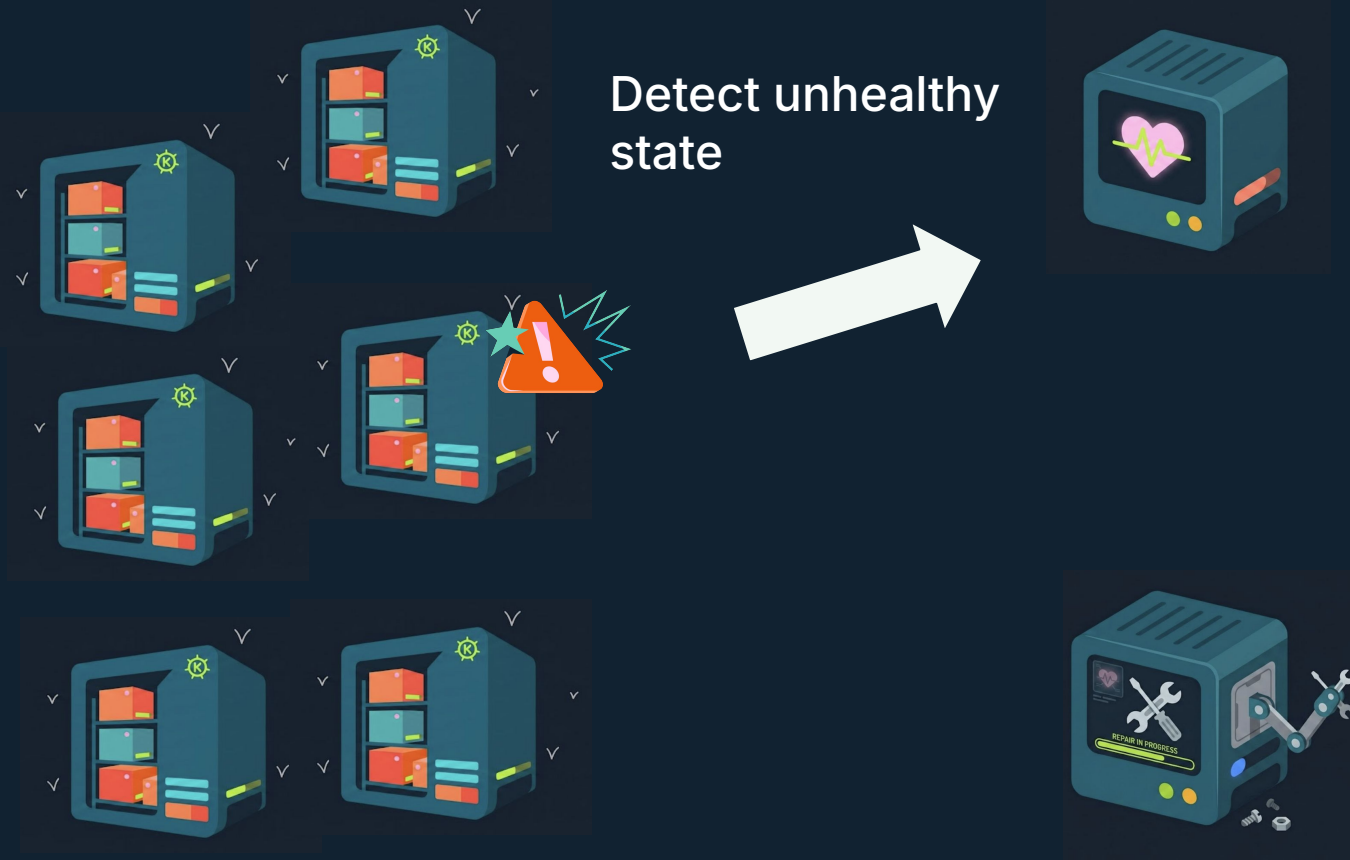


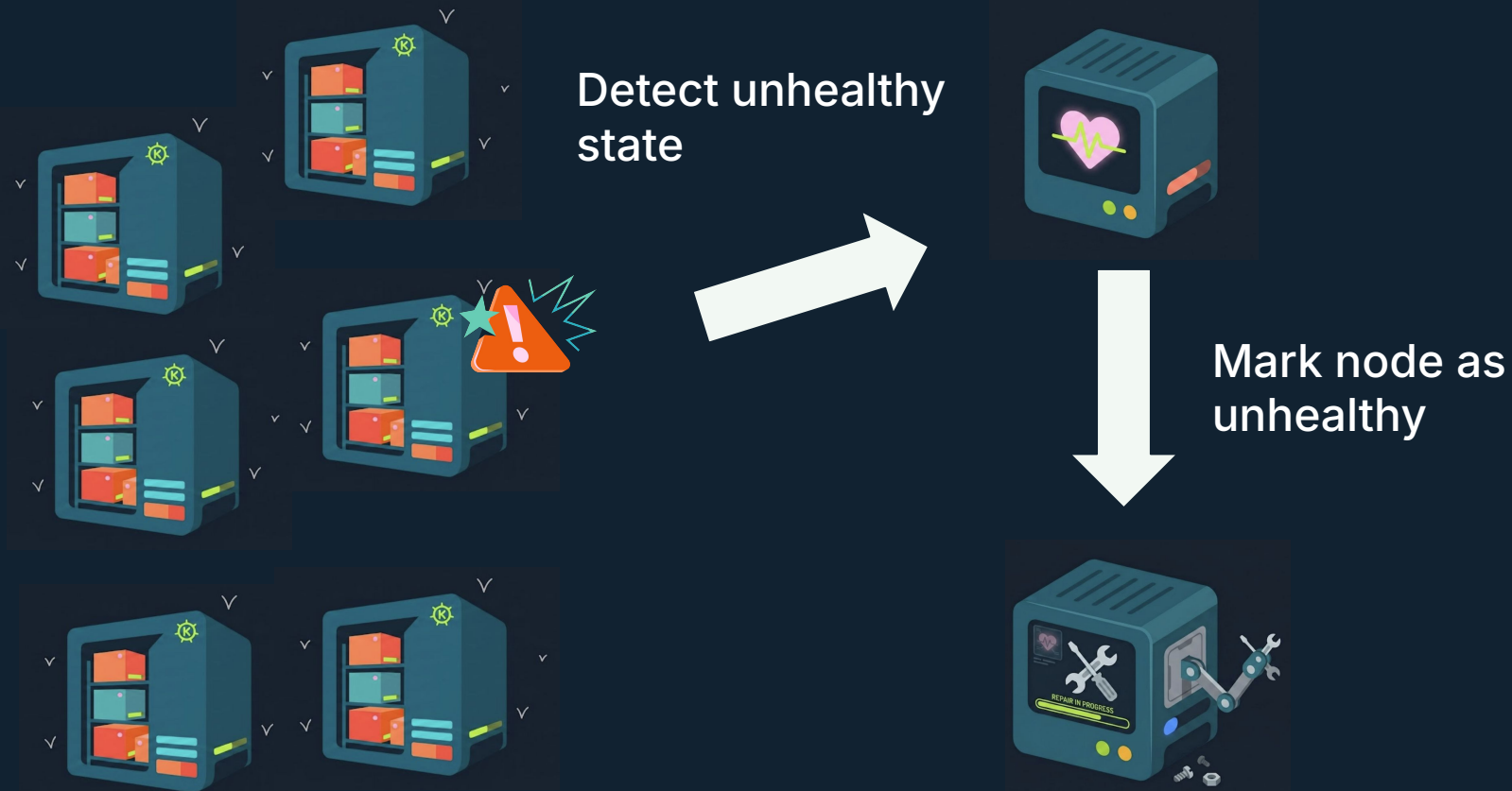
99.996% availability



Small number of nodes
entering unhealthy state

Causing tail latency under
load

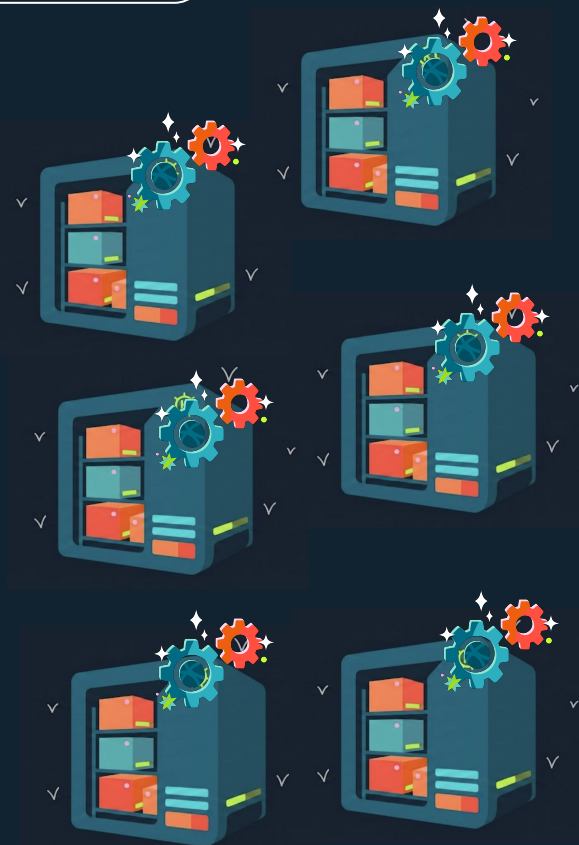




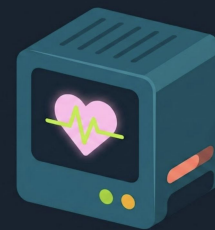


Replace node



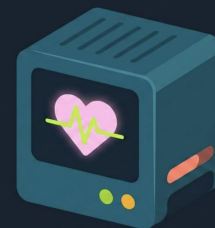


Restarting nodes
marked as
unhealthy

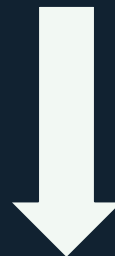




Nodes come back
up



But still marked as
unhealthy ...



... and replaced.



**Reliability is an emergent property
of a complex system**

Implications for eng organisations

- 1** You can't test your way out of everything
- 2** Measurement must be part of the system
- 3** The org must be built for response and learning

Assume partial failure & measure everything

Incidents will happen. Our choice is how early we notice.

Measurements should include:

- Behavioural metrics (customer intent, conversion)
- Tail latency (P95, P99, ...)
- Anomaly detection to help detect slow-burn incidents

Build an organisation with a high speed of iteration

Change should be as cheap as possible.

And even cheaper to undo.

BUGS AND RELEASES

Smaller releases mean fewer bugs that are easier to fix. Big releases usually mean big problems.



Technical debt is a useful tool: accountability makes it safe

- Know that you are taking it
- Know what it will cost
- Have an owner and a plan to pay it back.

Measure your investment into reliability

Cost of quality (CoQ) is the total cost of operating a product at a level of quality:

- Proactive: Work towards preventing failures in prod
 - Writing tests, instrumenting for observability, improving incident response runbooks
- Reactive: Work towards responding to failures in prod.

Culture of transparency and learning

Incentives and culture shape outcomes. A healthy post-mortem culture is an essential capability.

- Designed for learnings: blameless, curious and focused on understanding
- Easy to do, well supported by tooling
- Not done until actions have owners and plans
- Learnings broadcast to maximise impact and normalise transparency

Building for reliability

- 1** Measure reality
- 2** Optimise for reversibility
- 3** Use technical debt deliberately & with accountability
- 4** Balance speed and quality with a metric
- 5** Culture of transparency and learning



Thank you!